generally remains seated in bed, and as his head nods backwards and forwards, be frequently knocks it against the posts, which he says relieves the colicky pains he so often has at night. He walks with difficulty, and cannot run at all; the power of the right arm and leg is almost lost. His intellect is exceedingly precocious, and his sensitiveness of mind often obliges him to desire death.

In the above case there has evidently been an arrestation of development, the anterior parietes of the bladder being wanting, constituting what is called exstropion of the bladder. The child most probably belongs to the female sex, but whether there is a womb within or not, is of course uncertain. The hernia of the left side would appear to be formed by the rectum, which instead of descending into the pelvis, seems to pass immediately below the urinary organ, and turning at a right angle, to end just below the pelvis.—*Gaz. Méd. May 2d*, 1835.

2. *Vascularity of the Serous Membranes.*—For some time, most anatomists have asserted, that the serous membranes are not vascular, and consist solely of a species of epidermis, beneath which are the vessels. M. Roux stated at a late meeting of the Academy of Medicine, that among the beautiful anatomical preparations of Panizza, an Italian anatomist, he has seen serous membranes, of every variety, entirely isolated, and the existence of a great number of vessels in them demonstrated by injection.—*Archives Générales, Dec.* 1834.

PHYSIOLOGY.

3. *New Principle, (Sub-rubrine,) discovered in Human Blood.* By W. B. O'Shaughnessy, M. D.—A few days before my departure from Calcutta in April last, while engaged in the analysis of some specimens of blood drawn from patients labouring under disease of the spleen, my attention was forcibly attracted by some very remarkable phenomena, which were wholly inexplicable according to the previous state of our knowledge of the composition of the blood. These appearances surprised me the more, as in the course of my inquiries regarding the chemical pathology of the cholera, I was necessarily obliged to subject nearly two hundred samples of blood to a rigorous analysis, conducted chiefly according to the processes recommended by Lecanu and Denis, whose works are the latest and best authorities on this interesting subject.

The appearances I allude to, first presented themselves during an experiment made to ascertain the amount of colouring matter in 1000 grains of spleen blood. Being pressed for time, I adopted a mode of analysis calculated to afford more expeditious results than that I was previously in the habit of employing. It consisted in decanting the serum, and depriving the coagulum of its fibrine by kneading it in a muslin bag. Alcohol was then added, with a view to coagulate and throw down the colouring matter and adhering albumen. The precise amount of this albumen being readily known by data afforded by the analysis of the serum, the amount of pure colouring matter can thus be precisely computed. When the alcohol was added, and the coagulation effected, I threw the mixture on a very fine muslin filter, a very turbid fluid immediately passed through. Supposing that this was merely imperfectly coagulated colouring matter, I boiled the turbid fluid in order to accelerate the separation I expected; to my surprise, however, instead of this effect, the very contrary was produced. The heated fluid, instead of coagulating, became more transparent, and all the turbid flocculi were dissolved when the boiling point was attained. Allowed to cool, the solution again became cloudy, and when at 80° Fahrenheit, a copious deposit of a faint flesh colour was obtained. By alternate heating and cooling, whether gradual or sudden, the same effects were

indefinitely produced. A portion was filtered and dried, in which state it was soluble in dilute alcohol, infusible when heated on platinum foil, and insoluble in sulphuric ether.

To those practically conversant with this department of animal chemistry, I need scarcely observe, that the preceding facts afforded by themselves the strongest evidence of the existence of a principle previously unknown in the blood then under examination. But as several gentlemen, who may hear or read this paper, are much more profitably employed than in the pursuits of practical analysis; I will venture to explain these proofs of the specialty of the principle in question.

The *animal* principles previously known to exist in human blood, were fibrine, albumen, oil, a compound of albumen and soda, traces of urea, and the red principle, called by some *hematosine*, by others simply *colouring matter*, and which, I think, should be termed *rubrine*, in conformity with the radical source from which the names of the other substances have been derived.

The substance noticed in the above experiment could not have been fibrine, because all the fibrine had been previously removed.

It could not have been albumen, as albumen is coagulated permanently by heat and by alcohol, separately or conjointly, whereas, the new substance was soluble in dilute alcohol in the boiling state.

It could not have been urea, for urea is soluble in hot and cold alcohol and water, but the new principle was precipitated as its solution cooled. The same remark applies to the albuminate of soda, and from this substance it was still more unequivocally distinguished by numerous other properties which I shall subsequently detail.

Lastly, it could not have been the oleaginous matter, as that ingredient of the blood requires very strong and a hot alcohol for its solution, is fusible by heat, and soluble in cold sulphuric ether. The new principle is soluble in diluted alcohol, *infusible when heated* in the dry state, and *totally insoluble in sulphuric ether*, at any temperature.

The existence of a previously unknown principle in the specimen of blood then before me, having been thus unequivocally ascertained, several interesting questions immediately arose. Was this substance peculiar to blood in spleen disease, or common to that and the healthy fluid?—constituted the most essential and interesting inquiry. By the kindness of my friend, Mr. Twining, and with the opportunities I enjoyed as acting assistant-surgeon of his Majesty's 94th regiment, I was speedily enabled to ascertain, by numerous experiments, that the new principle is of universal occurrence, in health, in disease, in the Indian and European, and in all conditions of age and sex. Since my departure from Calcutta, I have further detected it in the cow, horse, goat, sheep, jackal, fox, and dog.

The average quantity in 1000 parts of blood was readily found by a repetition of the process which led to the discovery of the principle itself. It was thereby ascertained to vary in amount from 15 to 20 grains per 1000, thus exceeding considerably the amount of fibrine, and ranking next in proportion to the albumen.

Fifty grains were next subjected to special proximate analysis, in order to obtain a more accurate knowledge of its properties, and thus, if possible, to be enabled to name it correctly, with reference to its nature and composition. * In the dry state it is opaque, pulverulent, of a reddish-brown colour, totally infusible by heat, leaving a very minute, earthy residuum when calcined on platinum, foil, or mica; insoluble in absolute alcohol or distilled water when cold, but soluble in dilute alcohol at the boiling point, (insoluble in ether, or the oils, fixed or essential,) and again deposited of a faint flesh colour on cooling; redissolved instantly by the addition of nitric acid, in the proportion of one drop to 1000 of the mixture, and the solution rendered turbid by ferro-prussiate of potassa, and tincture of galls; unaffected by currents of oxygen, hydrogen, nitrogen, sulphureted hydrogen, and carbonic acid gas.

To complete the history of this remarkable substance, a minute ultimate analysis is preremptorily required. I regret to say that I do not possess the necessary apparatus required; neither can I in this remote situation attempt the construction of one on which I could at all rely. In my journey here, my barometer and all my spare glass tubes were broken to pieces; I must, consequently, wait some more favourable opportunity of completing this branch of the inquiry. Meanwhile, without straying beyond established facts, and without far over-stepping the bounds of legitimate induction, we may endeavour to estimate the relations which exist between this substance and the other well-known animal ingredients of the blood.

In the first place, while it differs remarkably from the colouring matter, or *rubrine*, and from the *albumen*, we still find it participating in some of the properties of each, to a degree that establishes a certain affinity among the entire. While it differs from the rubrine in its relations to heat and its solubility in dilute alcohol, it nevertheless resembles it strongly in the most important and peculiar of its properties, namely, *the red colour*. Again, while the new substance differs widely from albumen, also in the mode in which they are affected by heat and alcohol, it still exhibits the same reactions with tincture of galls, ferro-cyanate of potassa, some of the acids, the alkalies, and with the gases I have above enumerated. Thus, while on the one side we establish the essential differences between the three substances, we trace their analogies on the other. We find a resemblance sufficiently strong to warrant us in deeming it highly probable, that in the wondrous laboratory of the living frame, this new principle exemplifies the concluding stage in the hitherto obscure process of the complete reddening of the blood. An additional and important step, it is highly probable, is thus added to our knowledge of the various changes which occur, from the time that the digestive transmutation of aliment commences, until the change is consummated by the formation of blood. Dr. Prout first showed us the imperfectly formed, or "incipient" albumen in the contents of the duodenum and jejunum intestines. The researches of other chemists pointed it out when fully formed in the thoracic ducts. The colouring matter, too, we may trace in the pink coagulum of the chyle, but it is still imperfect, still requires elaboration in the lungs, and, in point of fact, as I have ascertained by experiment on the dog, is chiefly composed of the new principle, to which I have had the honour of drawing the attention of the society.

We have thus, I conceive, acquired a sufficient amount of evidence to warrant the application of the term *sub-rubrine* to the principle now pointed out. Additional researches will, it is to be hoped, increase our knowledge of its properties, and possibly may derange some of the preceding conclusions: nevertheless, the denomination I propose will continue to be appropriate, since it necessarily involves no theory or conjecture, and rests chiefly on the physical fact of the modified red colour of the principle itself.—*The Lancet, February 7th*, 1835.

4. *Experiments relative to the Sense of Taste.* By Mr. Noble.—Mrs. Williams, about fifty years of age, 22, Pot street, Ancotas, Manchester, states, that some years ago she had two or three leeches applied to the left temple, near the outer canthus of the left eye, when, in a day or two afterwards, violent neuralgic pains ensued upon the left half of the face; these gradually subsided, and left almost complete amaurosis, and paralysis of sensation on the affected side of the head and face, as supplied by the branches of the fifth nerve; the function of voluntary motion remaining perfect as before. In this state she continues at the present time.

There is a peculiarity in this case to which I would particularly allude, in the fact of the sense of taste being unimpaired in the left half of the tongue, whilst its common sensibility is all but destroyed. The impressions of common tact, of pain, of the rough or the smooth, of heat or of cold, she is all but insensible; whilst to impressions of the bitter or the sweet, or any other modification of

the sense of taste, she is as acutely alive on the affected as on the sound half of the tongue. For example, if she be blindfolded, and directed to protrude the tongue, and the blade of a knife be placed upon the lingual surface transversely, she feels it only on the sound side, or at least her perception on the affected side is of the most obscure description, being, as she words it, a "numb, deaf feel." A portion of the mucous membrane on the affected side was lacerated with a point of a lancet, and she felt not the slightest pain—all, in her own words, being "numb and dead." The blade of a knife was introduced into hot water, and then placed transversely upon the tongue: she had only the perception of heat on the sound side. Small portions of common salt were sprinkled upon the affected side, and similar quantities of sugar on the other: she was insensible to the fall of the particles on the affected side. In a few seconds, however, when the sapid particles had partially dissolved, she was as acutely alive to the saline taste on the affected half as to the saccharine on the other; and the sensation of taste was excited at the same distance of time from the first contact of the sapid ingredient on both sides of the tongue. These experiments were modified in a variety of ways, the woman always being blindfolded, and in ignorance of the exact procedure, or its intention; and in whatever way the trial was varied, it was obvious that whilst the common sensation of one-half of the tongue was in effect annihilated, the sense of taste was unimpaired.

Does not the above case decide that taste is something more than a modification of common sensation? And if so, must it not, as in the case of smell, be dependent upon a specific nervous supply? And as a variety of facts show clearly that the "true gustatory nerve" conveys both common and specific sensibility to the tongue, must it not be a compound nerve?

What is the function of the nerve from Meckel's ganglion, called *chorda tympani*, which joins the branch that goes to the tongue from the Gasserian ganglion?—of which nerve that distinguished neurologist, Mr. Swan, observes, "it is supposed that the cord of the tympanum does not unite with the gustatory, but passes in mere contact with this; but if a preparation that has been kept in spirits be carefully examined with a magnifying glass, and at the same time an attempt be made to disunite these nerves, it will be found that the filaments of both are intermixed, and cannot be separated without violence."

And in conclusion,—what is the function of the branches from Meckel's ganglion distributed to the soft palate?—*Lond. Med. Gaz. November*, 1834.

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5. *Influence of the Nerves in the Development of the Muscular System.* By Prof. Alessandrini.—In the annals of natural history for 1829, M. Alessandrini published a description of a fœtal calf in which a portion of the spinal marrow was wanting, and observed the singular anomaly that all that part of the system of voluntary muscles which receive their nerves from the spinal marrow, was also absent.

The vertebral column and spinal marrow terminated suddenly at the tenth dorsal vertebra, and a portion of the trunk, with the posterior extremities, exhibited no trace of muscles: but the parts, intimately composed of cellular tissue, appeared little different from their natural condition; and the integuments, the adipose tissue, the vascular system, and the aponeuroses and osseous system of the same extremities, did not seem to have been influenced, either in regard to development or structure, by the total absence of spinal nerves.

The connexion between nervous and muscular development, is a question that has long occupied the attention of physiologists, but one fact, however striking, is not sufficient to inspire much confidence in any hypothesis on a subject so interesting and so much controverted. A new opportunity soon presented itself to the professor, of judging the question with greater accuracy: he accidently became possessed of the fœtus of a sow arrived at the full term of gestation, and killed at the public market of Bologna. The monster resembled perfectly the one just alluded to. A great portion of the vertebral

column was wanting, and the spinal marrow terminated abruptly at the level of the fifth dorsal nerve; the head, neck, and anterior region of the chest, with the thoracic extremities, were furnished with well-developed muscles; but the posterior part of the thorax and the whole abdomen had the appearance of a large ovoid bag, with aponeurotic parietes, supported inferiorly on the ossa innominata, on which the posterior limbs were fixed. All trace of muscular structure began suddenly to cease at the points where the osseous parietes of the chest, the vertebral column, and the spinal marrow, were interrupted. Among the muscles which in ordinary circumstances compose the abdominal parietes, there only existed portions of those which arise high up from the thorax, and receives nervous filaments from the first dorsal nerves. A great portion of the thoracic parietes, all the abdominal parietes, and the posterior limbs, being deprived of spinal nerves and voluntary muscles, were merely composed of those parts essentially formed of cellular tissue. The viscera of the thorax and abdomen, where the branches of the vagus and sympathetic nerves could be most easily distinguished, were in the natural state.

The strata of muscular fibres were very visible in the whole length of the intestinal canal, and also on the urinary bladder, because those parts, removed from the empire of the will, are developed under the influence of the great sympathetic.

The second case of monstrosity was still more interesting than the former, because a small portion of the caudal vertebral column reäppeared between the ossa innominata, and contained a slender cylinder of medullary matter, from which a few fine nervous filaments, detached, were distributed on some bundles of muscular fibres, representing the caudal muscles: thus the system of voluntary muscles reäppeared with the imperfect development of nerves in the caudal vertebræ.

From the above cases of monstrosity the author derives the following corollaries regarding the regular formation and development of parts, and the influence of different systems on each other, with respect either to their mode of formation and growth, or their action and vital properties.—

1st. The nervous system contributes more than the vascular to the formation of the muscular fibre; the blood-vessels in two cases related, were regularly disposed in the posterior limbs, but wherever the nerves were wanting, the absence of muscular tissue was also recognised.

2d. The muscular fibre is formed, not only under the influence of the nerves of animal, but also of those of organic life.

3d. In both the monsters, those parts deprived of spinal nerves and voluntary muscles were not completely without traces of a nervous system; for large filaments of the great sympathetic followed the ramifications of the iliac arteries, and those portions of the abdominal vessels not usually supplied with nerves, were in the present case accompanied by numerous filaments.

4th. The absence of nervous substance in the vegetable kingdom brings with it a corresponding absence of muscular fibre, and the coëxistence of these two tissues constitutes the essential anatomical character by which animals are distinguished from plants.

6th. The presence, in the second monster, of a portion of spinal marrow totally distinct, and separated by a considerable distance from the rest, shows that the various sections, the different neuclei or centres of the cerebro-spinal axis, are formed and developed independently of one another.—*Bullettino di Bologna, Jan. 7*, 1835.

PATHOLOGY.

6. *Curious Case in which Sand and Gravel Stones were found in the Trachea after Drowning.*—C. F. H. aged twenty-three, had been subject to epileptic fits since October, 1830, with intervals of a week or a fortnight. On the 5th of May, 1833, he was found dead in a rivulet; his face donwwards; the head